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PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES; APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES

Draft decision proposed by the Bureau

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PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES

Draft decision proposed by the Bureau

The Preparatory Committee,

1. Welcomes the report of the Secretary-General of the Conference on the Protection of the Quality and Supply of Freshwater Resources (A/CONF.151/PC/73) and the Options for Agenda 21 on freshwater resources (A/CONF.151/PC/42/ADD.7). Requests the Secretary-General of the Conference to consolidate and integrate related programme areas and rationalize their presentation for consideration at its fourth substantive session. The Committee requests the Secretary-General of the Conference to take into consideration inter alia all relevant paragraphs of General Assembly resolution 44/228, the relevant resolutions taken at the first and second substantive sessions and the decisions taken at this substantive session, in the preparation of a draft Agenda 21 section on Freshwater Resources.

2. Emphasizes the need to include the requests made hereunder into the Options for Agenda 21 on freshwater resources as amended at the third session of the Preparatory Committee and annexed to this decision.

3. Requests the Secretary-General of the Conference to further develop the six programme areas for freshwater resources, as given in the Annex, in relation to Means of Implementation, incorporating the suggestions and comments from delegations.

4. Having revised the Options for Agenda 21 on freshwater resources at its third session, agrees upon the inclusion of the following particularly important revisions and additions:

- "Integrated water resources management" as the principal programme area; other programme areas are: "Water resources assessment", "Protection of water quality and aquatic ecosystems", "Drinking water supply and sanitation", "Water and sustainable urban development" and "Water for sustainable food production"

- recognition of the need to identify implementation mechanisms as a crucial element of Agenda 21
- increased emphasis on the developmental aspects of integrated freshwater resc ces management
- attention to the water problems of specific concern to developing countries, including ecosystems and human health protection
- capacity building, awareness building, education, financial arrangements and research and development programmes as crucial prerequisites for water management
- importance of an integrated approach to pollution control, including preventative measures and risk management
- interlinkages between fresh and marine waters and the protection of wetlands and biodiversity
- groundwater protection as an integral component of the freshwater issue
- importance of identifying actions required at the local, national, regional and global levels for water management
- importance of large-scale hydrospheric phenomena
- inland fisheries and aquaculture as important elements to be included
- importance of the need for participation of women and indigenous peoples in water management

5. Requests the Secretary-General to prepare an Addendum to the Options for Agenda 21 on freshwater resources which elaborates, inter alia, on the following issues:

- implementation mechanisms
- global and regional cost estimates
- research and development
- programme areas requiring further elaboration with regard to objectives and activities

6. Request the Secretary-General to submit the revised Options for Agenda 21 (as given in the Annex) together with the above mentioned Addendum, to the International Conference on Water and the Environment (ICWE) in Dublin, inviting the ICWE to

- review this material with particular attention to implementation aspects
- recommend appropriate mechanisms and economic instruments for implementing and coordinating the programmes which it will present to the UNCED
- identify options for improved coordination and cooperation on water management at the local, national, regional and global level
- submit its recommendations to the Secretary-General of UNCED before the fourth session of the Preparatory Committee

7. Request the Interagency Steering Committee of the ICWE to harmonize the working group themes of the ICWE with the programme areas of Agenda 21, as contained in the Annex.

8. Urges the member organizations of the ACC Intersecretariat Group for Water Resources, and Governments, in light of the acute financial situation, to contribute generously to the preparation and organization of the ICWE.

9. Requests the Secretary-General to submit the recommendations of the ICWE to its fourth session, along with the options for Agenda 21 on freshwater resources as annexed and the above mentioned Addendum.

PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES

Options for Agenda 21

I. INTRODUCTION

1. Effectively integrated management of water resources is important to all socio-economic sectors relying on water. Rational allocation prevents conflict and enhances the social development of local communities as well as economic planning and productivity. Efficient demand management allows water-using sectors to make long-term savings on water costs and stimulates resource-conscious production technologies. Health conditions and environmental quality should also improve either resulting from integrated development planning or as a beneficial consequence of improved environmental or social conditions.

Linkages to other Environmental and Developmental Issues

2. Water is a finite resource, essential for the sustenance of life on earth. Virtually all the environmental issues listed in the United National General Assembly resolution 44/228 are directly or indirectly linked to freshwater issues. With increase in economic activities and the consequent potential for stress on ecosystems and natural resource stocks, the study of linkages between freshwater issues and other sectoral and cross-sectoral issues is becoming increasingly important. Socio-economic pursuit—including urbanization, industrial production and agricultural activities—has reached a stage where freshwater issues have often become the limiting factor for sustainable development. Freshwaters—rivers, reservoirs, lakes and ground waters—are in contact with other ecosystems and are used in a variety of human activities, many of which would not be possible without a freshwater supply of adequate quality and quantity.

3. Poor land-use management, including deforestation, non-sustainable agriculture, mining and urbanization, could lead to a considerable increase in erosion problems and related soil loss in the river basins. The sedimentation in large reservoirs may have serious adverse effects downstream by reducing the quantity of natural nutrients available to agricultural land or to coastal waters. The loss of nutrients can lead to increased fertilizer use and decreases in coastal fishery yields. Acidification of surface and some ground waters due to atmospheric deposition of air pollutants can lead to depletion of freshwater living resources, contributing to the loss of biodiversity. Construction of dams for hydropower and irrigation, water channelization, over-

abstraction from aquifers, use of water bodies as open sewers for discharge of both domestic and industrial wastes can lead to salinization of rivers, lakes, and soils, salt intrusions in coastal aquifers, and serious water pollution problems. Should global warming occur as a result of climate change it may affect the world's freshwater resources through changes in the hydrologic cycle, resulting in changes in precipitation, with possible decreases in many areas of the Northern Hemisphere, accompanying decreases in soil moisture and annual river runoff. Even in the absence of global warming, natural variation in precipitation may be expected as in the past, resulting in periodic drought which can impact water availability, with consequent negative implications for economy and development.

4. Water-related diseases are still a major health problem, especially in the developing countries. Diseases caused by microbiological pollution of water supplies or transmitted by water-associated vectors, and those related to inadequate sanitation and absence of clean water, are widespread. With water use per capita expected to increase significantly in developing countries with high economic or population growth rates, the volume of waste requiring treatment is expected to present a growing problem. To ignore the interactions and linkages between freshwater issues and other sectoral issues could result in severe social, economic or human health consequences.

II. GENERAL OBJECTIVES OF AGENDA 21

5. Water is a necessity of all life. The overall objective is to maintain the hydrological, biological and chemical functions of ecosystems and to adapt human activities to the limits of nature's carrying capacity.

6. Freshwater resources are an essential component of the earth's hydrosphere and an indispensable part of all terrestrial ecosystems. The freshwater environment is characterized by its hydrological regime including floods and droughts which have become more extreme and dramatic in their consequences in recent years. Global climate changes could also have their impact on freshwater resources and their availability and, through sea level rise, threaten coastal aquifers and small island ecosystems.

7. Freshwaters are a finite resource, not only indispensable for the sustenance of life on earth but also of vital importance to all socio-economic sectors. Development is not possible without

considerable exploitation of water sources in relation to other land use activities and the control of deforestation and desertification. Priority must be given to the sustenance of land/water ecosystems, with particular attention to wetlands and biodiversity, and the satisfaction of basic human needs for drinking water, health protection and food security. For any water utilization beyond this, freshwater resources have to be considered as an economic good with an opportunity cost in alternative uses.

8. The Mar del Plata Action Plan, which emerged from the United Nations Water Conference in 1977, remains generally valid as the common basis for national and international action programmes in the freshwater sector. The review of progress achieved in its implementation and resulting strategies for the 1990s are reflected in Economic and Social Council resolution 1991/... . Agenda 21 in this sector, as presented hereunder, is based on these strategies, on the results of the Global Consultation on Safe Water and Sanitation for the 1990s, held at New Delhi in September 1990 (General Assembly resolution 45/181) and on the results of the International Conference on Water and the Environment in Dublin, January 1992.

9. The wide-spread scarcity of freshwater resources and their aggravating pollution in many world regions demands truly integrated water resources planing and management. The multi-sectoral nature of water resources development in the context on socio-economic development must be recognized as well as the multi-interest utilization of water resources for agriculture, industry, urban development, hydropower, inland fisheries and other activities. Rational water utilization schemes for the development of surface and underground water supply sources have to be supported by concurrent water conservation and wastage minimization measures.

10. Integrated water resources management necessitates appropriate mechanisms at the global, regional, national and local levels for implementing, coordinating and funding the related strategies and action programmes. Management of water resources should, as far as possible, take place in a river basin context (catchment level). The options proposed by the International Conference on Water and the Environment—Development Issues for the 21st Century, [held] in Dublin, January 1991, provide the basis for identifying suitable implementation mechanisms.

11. Capacity building is a prerequisite to integrated water resources management. Technical solutions will not achieve programme objectives on their own without suitable attention given to the human factor. The Symposium on a Strategy for Water Resources Capacity Building, held in

Delft, June 1991, recognized the importance of capacity building for integrated and sustainable development of water resources at all levels. Capacity building consists of three basic elements:

- creating an enabling environment with appropriate policy and legal frameworks;
- institutional strengthening and development, including local community participation;
- human resources development, including the strengthening of managerial systems and water users interests;
- awareness building and education at all levels of society.

12. Adequate financial resources are indispensable for the effective utilization and protection of freshwater resources. Pursuant with the recognition of water as an economic good, but with priority to the satisfaction of basic needs, internal revenues have to be generated through cost recovery schemes, water tariffs, taxes, etc. reflecting marginal and opportunity costs. [In addition, external support is often required for water resources development from multilateral or bilateral sources (External Support Agencies) and from the private sector.]

13. Innovative technologies, including the improvement of indigenous techniques, are much needed to fully utilize limited water resources and to safeguard them against pollution. Implementation of Agenda 21 in the water sectors must therefore be supported by broad-based research and development programmes allowing for new technological solutions to be developed and field-tested. Technology [transfer] and [cooperation and diffusion] on all aspects of integrated water resources management is to be built into each programme area.

III. PROGRAMME AREAS OF AGENDA 21

14. In accordance with the general objectives, the following six components were developed for the freshwater sector:

(a) Integrated Water Resources Management
(b) Water Resources Assessment
(c) Protection of Water Quality and Aquatic Ecosystems
(d) Drinking Water Supply and Sanitation
(e) Water and Sustainable Urban Development

(f) Water for Sustainable Food Production

15. Each component is presented in this document in a format which covers the basis for action, objectives, and programme activities. [Implementation mechanisms will be identified by the Dublin Conference on Water and the Environment.]

A. INTEGRATED WATER RESOURCES MANAGEMENT

Basis for action

16. The extent to which water resources development contributes to economic productivity and social well being is not usually appreciated although all social and economic activities rely heavily on the supply and quality of fresh water. As populations and economic activities grow many countries are rapidly reaching conditions of water scarcity or face limits to economic development. Water demands are increasing rapidly, with 70-80% for irrigation, less than 20% for industry and a mere 6% for domestic consumption. The holistic management of water as a finite and vulnerable resource, and the integration of sectoral water plans and programmes within the framework of national economic and social policy is of paramount importance for action in the 1990s and beyond. The fragmentation of responsibilities for water resources development among sectoral agencies is proving, however, to be an even greater impediment to promoting integrated water management than had been anticipated. Effective coordination mechanisms are required not only at the national level but also at the inter-country and international levels.

Objectives

17. Integrated water resources management is based on water as an integral part of the ecosystem, a natural resource and an economic good. In developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water users should be charged its true marginal costs.

18. Integrated water resources management should follow four principal goals:

a. to promote a dynamic, interactive, iterative and multisectoral approach to water resources management which integrates technological, socio-economic, environmental and human health considerations

b. to plan the rational utilization, conservation and management of water resources based on community needs and priorities and within the framework of national economic development policy

c. to design, implement and evaluate projects and programmes which are both economically efficient and socially appropriate within clearly defined strategies, based on a full public participatory approach, including the participation of women and indigenous peoples in water management policy-making and decision-making at the community level as well as at the national, regional and global levels

d. to identify and strengthen or develop, as required, the appropriate institutional, legal and financial mechanisms to ensure that water resources development is a catalyst for sustainable social progress and economic growth.

19. The strengthening of national capacities to manage the resource and the role of government and local organizations in creating the enabling environment for efficient and equitable utilization of the resource are crucial. In the case of transboundary water resources there is an even greater need to formulate and harmonize water resources strategies and action programmes.

20. Although difficult to measure success in this area, quantitative targets could realistically be set as follows:

By the year 2000:

a. all developing countries will have designed and initiated costed and targeted national action programmes, and 75% of all countries will have appropriate institutional and legal structures in place.

By the year 2025:

b. subsectoral programme targets reached.

Activities

21. Countries, especially developing countries, with the assistance of relevant UN bodies and international donors, could implement the following activities to improve integrated water resources management in their countries:

a. formulation of costed and targeted national action plans and investment programmes

b. development of interactive databases, forecasting methods and economic planning models

c. optimisation of water resources allocation under physical and socio-economic constraints

d. Implementation of allocation decisions through demand management, pricing mechanisms and regulatory measures

e. flood and drought management using risk analysis and social impact assessment

f. promotion of schemes for rational water use through public awareness raising, educational programmes, levying of water tariffs and other economic instruments

g. development of new and alternative sources of water supply such as seawater desalination, artificial groundwater recharge, use of marginal-quality water, wastewater reuse and water recycling

h. integration of water quantity and quality management, including surface and underground water resources

i. promotion of water conservation and wastage minimization schemes for all users, including the development of water-saving devices

j. support to water users groups to optimize local water resources management

k. development of public participatory techniques and their implementation in decision making, particularly the enhancement of the role of women in water resources planning and management

l. development and strengthening, as appropriate, of implementation mechanisms at all levels concerned:

- at the global level improved delineation of responsibilities, division of labour and co-ordination of international organizations and programmes;

- at the regional level watershed-based organizations (river or lake basin authorities) and legal agreements for the joint management of transboundary water bodies;

- at the national level integrated water resources planning and management in the framework of the national planning process;

- at the local level delegation of water resources management to the lowest appropriate level, including decentralization of government services to local authorities, private enterprises and communities

m. elaboration, dissemination and application of operational guidelines in support of the implementation of national action plans and local water management schemes

n. capacity building, including the rationalization and strengthening of institutional and legal structures and the development of the necessary human resources basis.

B. WATER RESOURCES ASSESSMENT

Basis for action

22. Water resources assessment is the continuing determination of sources, extent, dependability, and quality of water resources. It is the practical basis for their sustainable

management and a prerequisite for evaluation of the possibilities for this development. There is, however, growing concern that at a time when more precise and reliable information is needed about water resources, hydrological services and related bodies are less able to provide this information, especially information on ground water and water quality. Major impediments are: the lack of financial resources for WRA, the fragmented nature of hydrological services and the insufficient numbers of qualified staff. At the same time the advancing technology for data capture and management is increasingly difficult to apply for developing countries. Establishment of national data bases is, however, vital to WRA and for mitigating floods and pollution.

Objectives

23. Based upon the Mar del Plata Action Plan, this programme area is extended into the 1990s and beyond with the overall objective:

> "To ensure the assessment and forecasting of the quantity and quality of water resources, in order to meet the needs of all sectors of society, to enable mitigation of water-related hazards, and to maintain or enhance the condition of the global environment."

Four specific objectives are set accordingly as follows:

a. to have all countries allocate to water resource assessment the financial resources which are justified by the economic and social value of information about their water resources;

b. to have all countries establish the institutional arrangements needed to ensure the efficient collection, processing, storage, retrieval and dissemination to users of information about the quality and quantity of available water resources in an integrated manner;

c. to make available to all countries water resource assessment technology which is appropriate to their needs, irrespective of their level of development, including methods for the impact assessment of climate change on freshwaters;

d. to have sufficient numbers of appropriately qualified and capable staff recruited and retained by water resource assessment agencies, and provided with the training and retraining they need to carry out their responsibilities successfully.

24. Quantitative programme targets can be set for the number of countries covered with adequate services:

a. by the year 2000 all countries should have studied in detail the feasibility of installing water resources assessment services;

b. by the year 2000 there should be water resources assessment services with a high-density hydrometric network installed in 70 countries, and services with limited but adequate capacity in 60 countries;

c. by the year 2025 there should be 110 countries with fully developed services, and 40 countries with services of a limited capacity;

d. the longer-term target is to have fully operational services, based upon high-density hydrometric networks, available in all countries.

Activities

25. Governments, with the assistance of relevant UN agencies, regional and international organizations and donor agencies, and through bilateral and multilateral agreements, could undertake the following activities:

26. a. increasing financial resources

- securing augmented budgetary allocations
- exploring novel ways of funding
- estimating the ecological, economic and social value of water resources data.

b. improving institutional arrangements

- facilitating close collaboration between water sector agencies, particularly between information producers and users
- reviewing the legislative and regulatory basis of WRA
- preparing catalogues of the water resources information held by government services, private sector, educational institutes, consultants, local water use organizations and others

- implementing water management policies based upon realistic appraisals of water resource conditions and trends.

c. upgrading and increasing technology transfer

- encouraging international organizations and donors to meet initially the immediate needs of the country commensurate with their technological standards
- developing strategies for meeting requirements over the medium and long term.

d. capacity building for WRA

- encouraging the provision of attractive terms of employment and career paths for professional and technical staff
- monitoring human resources needs and meeting them through education and training opportunities, and international programmes of courses and conferences
- strengthening the managerial capabilities of water users groups to improve water use efficiency at the local level.

C. PROTECTION OF WATER QUALITY AND AQUATIC ECOSYSTEMS

Basis for action

27. There are few regions of the world that are still exempt from problems of degraded water quality and the pollution of surface and groundwater sources. Problems which most affect water quality in developed and developing countries are domestic sewage and industrial waste discharges. In the rural areas, concern about the entry of fertilizers and pesticides into watercourses and groundwater aquifers is increasing. Aquatic ecosystems are disturbed and the living freshwater resources are threatened. Aquatic ecosystems are also affected by major and medium water resource development projects such as dams, river diversions, water installations and irrigation schemes. Erosion, sedimentation and deforestation have led to increased land degradation. Many of these problems have arisen from a lack of public understanding and education about surface and groundwater resource protection. Ecological and human health effects are the measurable consequences, although the means to monitor them are grossly inadequate or non-existent in many developing countries.

Objectives

28. Already the Mar del Plata Action Plan recognized the intrinsic linkage between water resource development projects and their important repercussions of a physical, chemical, biological and socio-economic nature. The overall environmental health objective was set:

> "to evaluate the consequences which the various users of water have on the environment, to support measures aimed at controlling water-related diseases, and to protect ecosystems".

29. Three objectives will have to be pursued concurrently to integrate water quality aspects into water resource management:

> a. maintenance of ecosystem integrity—a management principle to preserve aquatic ecosystems, including the living resources, and to protect them effectively from direct and indirect pollution;
>
> b. public health protection—a task requiring not only the provision of pathogen-free drinking water but also the control of disease vectors in the aquatic environment;
>
> c. human resources development—a key to capacity building and a prerequisite for implementing water quality management.

30. Three targets have been set to integrate water quality aspects into water resource management:

> a. by the year 2000 all countries should have effective water pollution control programmes, defined as enforceable standards for major point-source discharges and high-risk non-point sources, commensurate with their socio-economic development;
>
> b. by the year 2000 all countries should participate, as far as appropriate, in inter-country and international water quality monitoring and management programs such as the Global Water Quality Monitoring Programme GEMS/WATER, UNEP's Environmentally Sound Management of Inland Waters, FAO's regional inland fishery bodies, or the RAMSAR

convention on wetlands;

c. by the year 2025 the prevalence of water-associated diseases should be drastically reduced, starting with the eradication of dracunculosis (Guinea worm) by the year 2000 and onchocerciasis (river blindness) by the year 2000.

Note: activities for target (c) are included under D and in the chapter on human health aspects [PC/54].

Activities

31. All national governments, especially of developing countries, with the assistance of appropriate UN agencies and other international organizations, and in cooperation with the industrialised countries could embark upon the following activities:

a. water pollution control

- application of the polluter pays principle to all kinds of sources, including on-site and off-site sanitation
- introduction of the precautionary approach in water quality management
- mandatory environmental impact assessment on all major water resource development projects
- decisions to be based on risk assessment and risk management
- setting of water quality objectives and standards for pollution control
- preventive measures to avoid pollution through rational land-use planning
- controlled siting of industrial and waste facilities with regard to sensitive water bodies and aquifers.

b. Water quality protection requiring legal instruments

- monitoring and control of pollution in national and transboundary waters
- control of long-range atmospheric transport of pollutants
- control of accidental spills in national and transboundary water bodies
- environmental impact assessment

c. control of point-sources of pollution

- construction of treatment facilities for domestic sewage, drainage water and industrial effluents
- monitoring of all discharges of pollution to enforce compliance with standards, permits and other regulations.

d. control of diffuse pollution sources

- rational land use to prevent land degradation, erosion and siltation
- controlled use of agrochemicals to prevent eutrophication and chemical contamination of surface and ground waters.

e. application of clean technology

- control of industrial waste discharges, including low-waste production technologies and water recirculation
- treatment of municipal wastewater for safe reuse in agriculture and aquaculture
- development of biotechnology for waste treatment, production of biofertilizers etc.
- development of appropriate and indigenous methods for water pollution control.

f. groundwater protection

- mitigation of saline intrusion into aquifers of small islands and coastal plains as a consequence of sea-level rise
- prevention of aquifer pollution through the establishment of protection zones in groundwater recharge and abstraction areas
- design and management of landfills based upon sound hydrogeological information and impact assessment, using best available technology
- mandatory water quality monitoring, on a permanent basis, of surface and groundwaters potentially affected by landfills.

g. protection of aquatic ecosystems

- rehabilitation programmes for agricultural lands and for other users, taking into account equivalent action for the preservation and use of groundwater resources, important for agricultural productivity and for the biodiversity of the tropics
- rehabilitation of polluted and degraded water bodies to restore aquatic habitats and ecosystems

- conservation and protection of wetlands due to their ecological and habitat importance for many species as well as their socio-economic values
- control of noxious aquatic weeds which may destroy some other water species.

h. protection of freshwater living resources

- control of water quality to allow for the sustainable development of inland fisheries
- protection of ecosystems from pollution for the development of freshwater aquaculture projects.

i. capacity building for water quality management

- establishment and strengthening of institutional frameworks at national and local levels
- development of technical infrastructure for water quality monitoring, assessment and control to include capacity for standard setting, permits and effective enforcement at the national and local level
- training of professionals to enhance staff capabilities at technical and managerial levels
- dissemination of information to water users at all levels on, inter alia, ecosystems, the water cycle, water quality protection, source control measures and water-borne disease control
- awareness building on ecological and water quality issues at all levels.

D. DRINKING WATER SUPPLY AND SANITATION

Basis for action

32. Safe water supplies and environmental sanitation are vital for protecting the environment, improving health and alleviating poverty. An estimated 80 percent of all diseases and over one third of deaths in developing countries are caused through the consumption of contaminated water and on average as much as one tenth of each person's productive time is sacrificed to water-related diseases. Concerted efforts during the 1980s brought water and sanitation services to hundreds of millions of the world's poorest people. The most outstanding of these efforts is the launching in 1981 of the UN International Drinking Water Supply and Sanitation Decade (IDWSS)

which resulted from the Mar del Plata Action Plan adopted by the UN Water Conference in 1977. The commonly agreed premise was that "all peoples, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs." The target of the IDWSS was to provide safe drinking water and sanitation to underserved urban and rural areas by 1990. But even the unprecedented progress achieved during this decade was not enough. One in three people in the developing world still lacks these two most basic requirements for health and dignity.

Objectives

33. The New Delhi Statement formalized the need to provide, on a sustainable basis, access to safe water in sufficient quantities and proper sanitation for all, requesting "some for all rather than more for some". Four Guiding Principles provide for the programme objectives:

a. protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes;

b. institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour, and the full participation of women at all levels in sector institutions;

c. community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes;

d. sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies.

34. Past experience has shown that specific targets should be set by each individual country. At the Summit for Children in 1990, 71 heads of state or government called for both universal access to water supply and sanitation and the eradication of guinea worm disease by 1995. Even for the more realistic target to achieve full coverage in water supply by 2025, it is estimated that annual investments must reach double current levels. The only realistic strategy to meeting present and future needs, therefore, is to develop lower cost services that can be implemented and sustained at the community level.

Activities

35. All national governments, especially of developing countries, with the assistance of appropriate UN agencies and other international organizations, and in cooperation with the industrialised countries could embark upon the following activities:

a. the environment and health

- sanitary disposal of excreta and sewage
- expansion of urban water supply, sewage and drainage systems
- control of water-associated diseases
- treatment and reuse of domestic wastewaters

b. people and institutions

- changing the role of government towards decentralization, local authorities, private enterprises and NGOs
- human resources development at all levels, including special programmes for women
- broad-based education programmes, with particular emphasis on hygiene and local management
- international coordination mechanisms for programme funding and implementation

c. community management

- support to communities in owning and control of their own systems on a sustainable basis
- encouragement of women in water management
- linkages between national water plans and community management of local waters

d. finance and technology

- making service-agencies more cost-effective and responsive to consumer needs
- restructuring the utilization of funds with more attention to underserved rural and low-income urban areas
- rehabilitation of defective systems, reduction of wastage and reuse of water and wastewater
- programmes for operation and maintenance on the basis of cost recovery and

charging mechanisms

- research and development of appropriate technical solutions.

E. WATER AND SUSTAINABLE URBAN DEVELOPMENT

Basis for action

36. Early in the next century, more than half of the world's population will be living in urban areas. By 2025 that proportion will have risen to 60%, some 5 billion people. Rapid urban population growth and industrialization are putting severe strains on the water resources and environmental protection capabilities of many cities. Scarcity of freshwater resources and the escalating costs of developing new resources have a considerable impact on national industrial development and economic growth. Better management of urban water resources can make a substantial contribution to the alleviation of poverty and improvement of the health and quality of life of the urban poor. A high proportion of urban agglomerations are located on estuaries and in coastal zones. The resulting pollution from municipal and industrial discharges combined with overexploitation of available water resources contaminates the marine environment and threatens future supplies.

Objectives

37. The development objective of this programme is to support local and central governments' efforts and capacities to sustain national development and productivity through environmentally sound management of water resources for urban use. Supporting this objective is the identification and implementation of strategies and actions to ensure the continued supply of affordable water for present and future needs, and to reverse current trends of resource degradation and depletion.

38. The following targets have been set:

By the year 2000:

a. All urban residents have access to at least 40 litres per capita and day of safe water and 75% are provided with on-site or community facilities for sanitation.

b. All countries establish and apply quantitative and qualitative discharge standards for

municipal and industrial effluents.

c. 75% of solid waste generated in urban areas is collected and disposed of in an environmentally safe way.

By the year 2025:

d. All countries have established biological, physical and chemical quality criteria for all water bodies (surface and groundwater).

e. Biological, physical and chemical quality of water bodies is demonstrating steady improvement.

Activities

39. Countries, through regional and international cooperation, and with the support of NGOs and the private sector, could undertake the following activities:

a. protection of water resources from depletion and degradation

- introduction of sanitary waste disposal facilities based on low-cost upgradable technologies
- implementation of urban storm water runoff and drainage programmes
- promotion of recycling and reuse of waste-water and solid wastes.

b. efficient and equitable allocation of water resources

- reconciliation of city development planning with the availability and sustainability of water resources
- introduction of water tariffs which reflect the marginal and opportunity cost of water, while ensuring satisfaction of basic needs

c. institutional/legal/management reforms

- adoption of a city-wide approach to the management of water resources
- incorporation into municipal agencies plans of land and water management, housing and other urban development programmes
- utilization of the skills and potential of non-governmental organizations and the private sector

d. promotion of public participation

- initiation of public awareness campaigns to promote water conservation
- sensibilization of the public for the protection of water quality within the urban environment
- activation of public participation for the collection and recycling of wastes

e. support to local capacity building

- promotion of investments in urban water and waste management reflecting the major contribution of cities to national economic development
- provision of seed money and technical support to the local handling of materials supply and services
- encouragement of autonomy and financial viability of city water and sewerage utilities
- creation and maintenance of a cadre of professionals and semi-professionals for water, wastewater and solid waste management.

F. WATER FOR SUSTAINABLE FOOD PRODUCTION

Basis for action

40. Sustainability of food production increasingly depends on sound and efficient water use and conservation practices consisting primarily of irrigation development and management including water management in rainfed areas, livestock water supply, inland fisheries and agro-forestry. Rural development requires the integrated satisfaction of basic needs for drinking water and for food production. While significant expansion of the area under rainfed agriculture has been achieved during the past decade, the productivity response and sustainability of irrigation systems have been constrained by problems of water-logging and salinization. Soil erosion in the upper watersheds, mismanagement and over-exploitation of the natural resources in the drought-prone areas and acute competition for water, have all influenced the extent of poverty, hunger and famine in the developing nations. The development of irrigation schemes is most often not supported by environmental impact assessments identifying hydrological consequences within watersheds and due to interbasin transfers.

Objectives

41. An International Action Programme on Water and Sustainable Agricultural Development (IAP-WASAD) has been initiated by FAO in cooperation with other international organizations. The main objective of the IAP-WASAD is to assist developing countries in planning, developing and managing water resources on an integrated basis to meet the present and future needs for agricultural production, taking into account environmental considerations.

42. The IAP-WASAD has developed a framework for sustainable water use in the agricultural sector and identified priority areas for action at national, regional and global levels. Quantitative targets for new irrigation development, improvement of existing irrigation schemes and reclamation of waterlogged and salinized lands through drainage for 94 developing countries are estimated on the basis of food requirements, agro-climatic zones and availability of water and land.

43. [Objectives for livestock, inland fisheries and aquaculture to be inserted. References: PC/61 and PC/69.]

44. The projections for irrigation are as follows:

By the year 2000:

a. 21 million hectares of new irrigation development
b. 17 million hectares of improvement/modernization of existing schemes
c. 10 million hectares installed with drainage and water control facilities
d. 15 million hectares of small-scale irrigation water programmes and conservation.

45. The development of new irrigation areas at the above level may give rise to environmental concerns as this may imply the destruction of wetlands and a reduction in biodiversity. Before developing new irrigation schemes, efforts should be made towards a more rational exploitation of existing schemes, including increased efficiency and productivity. The active involvement of water users groups is a supporting objective.

46. [Quantitative targets for livestock, inland fisheries and aquaculture to be inserted.

References: PC/61 and PC/69.]

Activities

47. Countries, especially developing countries, with the cooperation of the private sector and NGOs, could undertake the following activities to protect their water resources from depletion and degradation:

a. water use efficiency

- increase of efficiency and productivity in agricultural water use for better utilization of limited water resources
- strengthening of water and soil management research under irrigation and rainfed conditions
- monitoring and evaluation of irrigation project performance
- support to water users groups with the aim to improve management performance at the local level

b. waterlogging, salinity control and drainage

- introduction of surface drainage in rainfed agriculture to prevent temporary waterlogging and flooding of lowlands
- introduction of artificial drainage in irrigated agriculture
- encouragement of conjunctive use of surface and groundwaters, including monitoring and water balance studies

c. water quality management

- establishment and operation of cost-effective water quality monitoring systems for agricultural water uses
- prevention of adverse effects of agricultural activities on water quality for other uses
- establishment of biological, physical and chemical water quality criteria for agricultural water users

d. small-scale water programmes

- development of small-scale irrigation, water supply for humans and livestock and

for water and soil conservation

- promotion of local initiatives for the integrated development and management of water resources
- provision of adequate technical advice and support and enhancement of institutional collaboration at the local community level

e. scarce water resources management

- development of long-term strategies and practical implementation programmes for agricultural water use under scarcity conditions with competing demands for water
- recognition of water as an economic good in irrigation planning and management
- formulation of specialized programmes focused on drought preparedness with emphasis on food scarcity, environmental safeguards and community resilience
- promotion and enhancement of wastewater reuse in agriculture

f. supporting capacity building

- development of adequate data bases and adaptive research
- institutional strengthening based upon human resources development at all levels, in particular water users groups
- transfer of existing water use technologies and support of their field application.

Note: Activities concerning livestock, inland fisheries and aquaculture to be added. References: PC/61 and PC/69.